UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,306	04/25/2001	David John Benjamin Pearce	CM00620P	6704

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EXAMINER
WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2004*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,4,6,7, 9-13,15,16,18,19 and 21-30* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6,7,9-13,15,16,18,19 and 21-30* is/are rejected.

7)☒ Claim(s) *9,10,21 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☒ All   b)☐ Some * c)☐ None of:

   1.☒ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
   Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   In response to the office action from 4/13/2004, the applicant has submitted an

amendment, filed 8/12/2004, amending the abstract and claims 1, 3, 6, 9, 11-13, 15, 18, 21, 23-

26, while canceling claims 2, 5, 8, 14, 17, and 20, adding claims 27-30, and arguing to traverse

the art rejection based on the limitation regarding various methods of replacing a speech vector

having a transmission error *(Amendment, Pages 10-11)*. The applicant's arguments have been

fully considered but are moot with respect to the new grounds of rejection in view of Nahumi

(U.S. Patent: 5,699,478) and Zingher *(U.S. Patent: 6,092,039)*.

2.   Based on the amendments to the abstract and claims, the examiner has withdrawn the

previous objections directed towards minor informalities and improper multiple dependent

claims.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

Claims 1, 13, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Nahumi *(U.S. Patent: 5,699,478)* in view of Zingher *(U.S. Patent: 6,092,039)*.

With respect to **Claims 1 and 13**, Nahumi discloses:

Identifying a group comprising one or more vectors that have undergone a transmission

error *(vector representation, Col. 6, Lines 1-21; and detecting a transmission error, Col. 6, Lines

36-58)*;

Replacing one or more speech parameters in the identified group of vectors, wherein he

one or more parameters in the identified group of vectors are replaced by respective replacement

parameters corresponding to one or more speech recognition parameters from a vector without

error received after the identified group of vectors *(Col. 6, Line 59- Col. 7, Line 12)*.

Although Nahumi teaches an error recovery technique similar to that of the present

invention, Nahumi does not teach the transmission of speech recognition vector parameters in a

distributed speech recognition system, however Zingher teaches a vocoder for use in an

automatic speech recognition system having a client and server *(Col. 5, Line 51- Col. 6, Line 13;

and Fig. 6)*.

Nahumi and Zingher are analogous art because they are from a similar field of endeavor

in speech parameter coding. Thus, it would have been obvious to a person of ordinary skill in

the art, at the time of invention, to modify the teachings of Nahumi with the use of a vocoder in a

distributed speech recognition process to provide a practical application for the method of

Nahumi to achieve speech recognition in a narrow bandwidth channel (Zingher, Col. 6, Lines 9-

14) while providing necessary error correction taught by Nahumi *(Col. 1, Lines 44-57)* to

overcome possible channel errors which can degrade speech recognition accuracy *(Zingher, suggested use of error correction in DSR, Col. 20, Lines 42-48)*.

With respect to **Claims 25 and 26**, Zingher further discloses a wireless communication link *(Col. 4, Lines 12-15)*.

With respect to **Claims 27 and 29**, Nahumi in view of Zingher teaches the DSR system featuring an error recovery means as applied to Claims 1 and 13. Additionally Zingher teaches the use of mel cepstral coefficients as speech parameters *(Col. 5, Line 51- Col. 6, Line 13; and Fig. 6)*.

With respect to **Claims 28 and 30**, Zingher further recites:

Speech recognition parameters include logarithmic energy *(Col. 8, Lines 20-29)*.

4.   **Claims 3 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nahumi *(U.S. Patent: 5,699,478)* in view of Zingher *(U.S. Patent: 6,092,039)*, and further in view of de Souza et al *(U.S. Patent: 5,884,261)*.

With respect to **Claims 3 and 15**, Nahumi in view of Zingher teaches the error correction system and method that conceals errors by replacing speech parameters from a error-containing frame with speech parameters from future correct frames, as applied to Claims 1 and 13. Nahumi in view of Zingher does not teach that a speech parameter is replaced from a closest frame, however de Souza teaches such a method (Col. 12, Lines 46-58).

Nahumi, Zingher, and de Souza are analogous art because they are from a similar field of endeavor in speech parameter coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Nahumi in view of Zingher

with the means for replacing a missing speech vector with a vector from a closest frame as taught

by de Souza in order to provide an alternate means of recovering a missing frame vector *(de*

Souza, Col. 12, Lines 48-53).

5.   **Claims 4 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nahumi

(U.S. Patent: 5,699,478) in view of Zingher *(U.S. Patent: 6,092,039),* further in view of de

Souza et al *(U.S. Patent: 5,884,261),* and further in view of Ozawa *(U.S. Patent: 5,305,332).*

Nahumi, Zingher, and de Souza teach the error correction system and method that

conceals errors by replacing speech parameters from a error-containing frame with speech

parameters from a closest frame, as applied to Claims 3 and 15. The combination of Nahumi,

Zingher, and de Souza does not specifically suggest a well-known method for error recovery

using interpolation, however Ozawa teaches such a method *(interpolating pitch and filter*

parameters from past and future proper frames to correct transmission errors, Col. 4, Lines 7-

12).

Nahumi, Zingher, de Souza, and Ozawa are analogous art because they are from a similar

field of endeavor in speech parameter coding. Thus, it would have been obvious to a person of

ordinary skill in the art, at the time of invention, to modify the teachings of Nahumi in view of

Zingher, and further in view of de Souza, with the use of interpolation in error recovery as taught

by Ozawa in order to provide improved error correction by using parameters from past and

future frames *(Ozawa, Col. 6, Lines 32-40).*

6.   **Claims 6-7, 11-12, 18-19, and 23-24** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Nahumi *(U.S. Patent: 5,699,478)* in view of Zingher *(U.S. Patent:*

6,092,039), and further in view of Yeldener et al *(U.S. Patent: 5,774,837)*.

With respect to **Claims 6 and 18**, Nahumi in view of Zingher teaches the error correction

system and method that conceals errors by replacing speech parameters from a error-containing

frame with speech parameters from future correct frames, as applied to Claims 1 and 13.

Nahumi in view of Zingher does not teach the method of error detection through comparison of a

speech estimate to a threshold, however Yeldener discloses:

An error mitigating method and apparatus, wherein determination of which speech

recognition parameter or parameters are to be replaced is performed by predicting fro vectors

received without error, a predicted value for each speech recognition parameter within the

identified group of vectors, and replacing those speech recognition parameters within the

identified group of vectors that are outside of a predetermined threshold relative to their

respective predicted value *(comparing an estimated pitch value of a frame to previous values to*

detect a variation in a speech signal indicative of an error, Col. 13, Lines 37-50).

Nahumi, Zingher, and Yeldener are analogous art because they are from a similar field of

endeavor in speech parameter coding. Thus, it would have been obvious to a person of ordinary

skill in the art, at the time of invention, to combine the method of estimating a pitch value and

comparing it to a threshold for error detection as taught by Yeldener with the error correction

system and method that conceals errors by replacing speech parameters from a error-containing

frame with speech parameters from future correct frames as taught by Nahumi in view of

Zingher to provide a means of further error detection for frame smoothing to improve the quality

of reproduced speech *(Yeldener, Col. 13, Lines 37-50)*.

With respect to **Claims 7 and 19**, Yeldener teaches a means for changing parameters of a

frame if one parameter does not satisfy a threshold condition, as applied to Claims 6 and 18.

Claims 11 and 23 contain subject matter similar to Claims 6 and 18, and thus, are

rejected for the same reasons.

With respect to **Claims 12 and 24** Yeldener teaches the subject matter applied to Claims

6 and 18, wherein an error is detected in a three frame period.

Allowable Subject Matter

7.   **Claims 9-10 and 21-22** are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of the

base claim and any intervening claims.

8.   The following is a statement of reasons for the indication of allowable subject matter:

With respect to **Claims 9 and 21**, the prior art of record fails to teach or specifically

suggest the combination of the comparison of mel cepstral speech vectors that are within a

predicted parameter value threshold to a set of reference vectors to find a best match vector and

then using that best match vector to replace a mel cepstral speech vector that fulfills an error

condition of being outside of a predicted parameter threshold with an error concealment system

for use in a distributed speech recognition system performed over a network that uses a vector

received after a detected error vector to determine the replacement best match vector.

Claims 10 and 22 further limit claims containing allowable subject matter, and thus, also

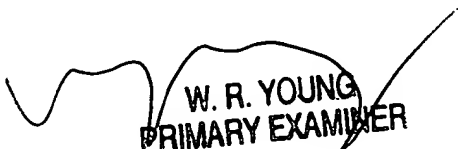contain allowable subject matter.

Conclusion

9.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure:

Zinser et al *(U.S. Patent: 5,073,940)*- teaches a method for error recovery using

interpolation between two good frames when a bad frame is received.

10.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632

and email is James.Wozniak@uspto.gov. The examiner can normally be reached on Mondays-

Fridays, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Wayne Young can be reached at (571) 272-7582. The fax/phone number for the

Technology Center 2600 where this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the technology center receptionist whose telephone number is (703) 306-

0377.

W. R. YOUNG
PRIMARY EXAMINER

James S. Wozniak
5/25/2005